UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
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San Francisco, CA 94105

March 27 2017

Mr. Anthony R. Brown
Environmental Manager
Atlantic Richfield Company
4 Centerpointe Drive, LPR 4-435
La Palma, CA 90623-1066

Subject: EPA co mments on Atlantic Richfield (ARC) Draft Off-Property Focused Remedial Investigation Work Plan Addendum No. 4 – Task Sampling and Analysis Plan for Fluvial Deposits Sampling in the East Fork Carson River (Draft Final), Leviathan Mine Site, Alpine County, California, dated May 18, 2016

Dear Mr. Brown:

The U.S. Environmental Protection Agency (EPA) has reviewed the Draft Final Off-Property Focused Remedial Investigation Work Plan Addendum No. 4 – Task Sampling and Analysis Plan for Fluvial Deposits Sampling in the East Fork Carson River, Leviathan Mine Site, Alpine County, California (TSAP) prepared on behalf of the Atlantic Richfield Company (ARC) by AMEC, dated May 18, 2016

This work was submitted to EPA pursuant to Administrative Order for Remedial Investigation and Feasibility Study, Leviathan Mine, Alpine County, California (CERCLA Docket No. 2008-18, June 23, 2008).

Background: On January 30, 2015 ARC submitted the EFCR SQT Technical Memorandum. On August
19, 2015 EPA provided written comments on the EFCR SQT Technical Memorandum. EPA did not agree with ARC's conclusion that the SQT data were sufficient to fully assess potential impacts of Leviathan Mine on the East Fork Carson River (EFCR). Further, EPA requested that ARC prepare a geomorphic analysis of sediment accumulation areas along the EFCR to identify areas for sampling of bed load sediment in accordance with the RI Statement of Work.

Five months later, on January 8, 2016 ARC provided a TSAP in response to EPA's August 19, 2015 request. On April 18, 2016, EPA provided technical review comments and direction to complete the 2016 field sampling, while resolving outstanding comments on ARC's Appendix B and the TSAP; including comments requiring geomorphic analysis of EFCR sediment to support development of a sampling strategy. ARC provided a response to comments and the revised TSAP on May 18, 2016.

EPA has completed its review of ARC's

- Response to EPA comments on Appendix B and finds that the ARC response to comments are adequate; and,

- Response to EPA's August 29, 2015 and April 18, 2016 comments on the TSAP and finds that the majority of the responses are adequate, with the following key comments (S3, S4 and S9) remaining as incomplete and outstanding:

  - **Previous EPA Comment on the TSAP dated August 29, 2015 and April 18, 2016 S3: Page 5, Last Paragraph of Section 4.0:** The text states that if concentrations of metals in sediment are higher in the downstream reach than in the upstream reach, that some source (that may or may not be Leviathan Mine Site (LMS)) in Bryant Creek contributes to the elevated concentrations. The DQOs as developed do not provide for identification of additional sources or assessment of the relative importance of Leviathan Mine as a source. Please add a problem statement regarding assessment of the source for elevated metals in sediment. Please develop the necessary problem statement and associated DQO for a path after the data are available. **ARC Response:** ARC's response refers to DQOs developed to evaluate sources of metals and sediment to Leviathan and Bryant Creek. **EPA Comment:** ARC's response remains as incomplete and outstanding. The response does not explain how these upstream DQOs would apply to sediment in EFCR. The revised text (and DQOs) appropriately focus on determining if metal contents of EFCR alluvial sediment downstream from the mouth of Bryant Creek are elevated above metals contents of EFCR alluvial sediment upstream from the mouth of Bryant Creek. However, the identification of the source for any elevated metals remains unclear. EPA directs ARC to provide a full discussion of any and all elevated metals detected in EFCR sediment downstream from Bryant Creek, in the Technical Data Summary report (TDSR) that incorporates all of 2015 and 2016 sediment and floodplain soil data, due by June 30, 2016.

  - **Previous EPA Comment on the TSAP dated August 29, 2015 and April 18, 2016 S4. Page 6, Section 5.1, Second Paragraph.** The last sentence states that additional investigations would be necessary to support a conclusion that Leviathan Mine Site was the cause of increased metal concentrations in the Downstream Reach. Please provide an additional problem statement and DQO for discrimination between Leviathan Mine Site and other potential sources. Discrimination between sources can be readily achieved through geochemical fingerprinting based on the RI data set and information to be collected under this TSAP. If the current analytical suite is not believed by ARC to be sufficient to chemically fingerprint Leviathan Mine sediment, then addressing the requested problem statement would require the addition of analytes. This TSAP should be modified to address these issues. **ARC Response:** ARC's response addressed geochemical indicators for site related metals in Leviathan and Bryant Creek and referred to a similarly limited discussion in the response to S3. The response also cites a future evaluation of stream sediment data collected at Leviathan and Bryant Creek to be provided in a future Technical Data Summary Report for stream sediment. **EPA Comment:** ARC's response remains as incomplete and outstanding. The response is limited to concerns within Leviathan and Bryant Creek. EPA's comment refers to possible Leviathan Mine impacts on the EFCR sediment. By June 30, 2017, EPA directs ARC to provide a response to comments and the Technical Data Summary

report(TDSR) to incorporate all of 2015 and 2016 data, address all of these and previous EPA comments, include additional new data, estimate exposure point concentrations (EPCs), identify data gaps and provide the full summary of the QC, QCSR, and DQA and data usability consistent with the QAPP. This topic requires additional discussion. Please schedule a technical meeting in sufficient advance to ensure that the June 30, 2016 ARC deliverable is responsive, complete and approvable.

- **Previous EPA Comment on the TSAP dated August 29, 2015 and April 18, 2016 S9. Page 19, Quality Control Sample Collection, First Paragraph.** The text refers to Table 2 for a summary of quality control (QC) samples to be collected. Table 2 does not include reference to radiometric dating. Please include a discussion of QC for radiometric dating laboratory analysis, and provide QAPP updates with easy to track amendment numbers. **ARC Response:** ARC provided discussion that instead of field QC sampling for radioactive dating, laboratory QC samples would be used, and ARC provided Appendix D, to be incorporated as an amendment to the RI/FS QAPP. **EPA Comment:** ARC's response remains as incomplete and outstanding. Appendix D included the laboratory's statement of qualifications (SOQ) followed by copies of laboratory methods for Lead (Pb)-210 (Alpha-Spectrometry), Cesium (Cs)-137 and Beryllium (Be)-7 (Gamma Spectrometry), and other associated preparation methods. While these documents will be good additions to the RI/FS QAPP, they do not replace the need to obtain measurement quality control criteria for these radiological methods. Please provide the information necessary to determine whether the individual Pb-210, Cs-137, and Be-7 results for each sediment sample can be used to determine sediment dating. Provide the quality control criteria for the methods listed in Appendix D. For example, according to the Lead-210 method, Section 9.0, Quality Control, a duplicate is run every 10 samples, a method blank sample and blank sample spike are run every 20 samples, each sample is spiked with Pb-209, and a quality control sample is analyzed. Please provide the measurement criteria to evaluate these QC samples.
  The gamma spectrometry method included Section 9, Quality Control, and listed duplicate samples and calibration efficiency calculations as items to measure quality control and precision. The laboratory SOQ and the methods refer to various laboratory internal Standard Operating Procedures (SOPs), which must be provided, along with the document titled "AO1400, Validation of Methods and Estimation of Uncertainty of Measurements."

  ARC must provide the QC samples and the laboratory 's measurement criteria, in order to evaluate the quality of the Pb-201, Cs-137, and Be-7 results and whether they are of suitable quality for the intended use. Please provide the list of laboratory QC samples and measurement criteria against which the data will be evaluated. This information should be provided in the QCSR as part of the technical data summary report due June 30, 2017.

By June 30, 2017, EPA directs ARC to submit a Technical Data Summary report (TDSR) to incorporate all of 2015 and 2016 data, address all of these and previous EPA comments, include additional new data, estimate exposure point concentrations (EPCs), identify data gaps and provide the full summary of the QC, QCSR, and DQA and data usability consistent with the QAPP. Similar to the Technical data summary reports on the Mine Waste, groundwater and surface water media; this information will become part of a full complete and final robust Soil/Sediment Characterization chapter, along with a baseline risk assessment in the draft RIFS due to EPA on or before December 31, 2017.

Within 30 days, ARC should provide a response that it concurs with these comments and will incorporate them as requested. Should ARC find that they disagree, do not concur, or will not incorporate EPA comments, then this should be discussed with EPA immediately to ensure that these submittal in June is satisfactory.

If you have any questions, please feel free to contact me at (415) 947-4183 or Deschambault.lynda@epa.gov.

Sincerely,

Lynda Deschambault
Remedial Project Manager

Cc by electronic Email:

Douglas Carey, California Regional Water Quality Control Board, Lahontan Region
Michelle Hochrein, Washoe Tribe of Nevada and California
David Friedman, Nevada Department of Environmental Protection
Kenneth Maas, United States Forest Service
Tom Maurer, United States Fish and Wildlife Service
Toby McBride, United States Fish and Wildlife Service
Steve Hampton, California Department of Fish and
Wildlife Marc Lombardi, AMEC

HISTORY ON APPENDIX B:

- **EPA April 18, 2016 Comment on Appendix B: Investigation Areas:** The upstream investigation area shown in Figure B1 extends upstream from the immediate vicinity of the mouth of Cottonwood Creek. This is appropriate to avoid the potential effects of irrigation return flows from River Ranch. However, sampling transects along EFCR within 1 or 2 river miles upstream from Cottonwood Creek should also be included. The downstream investigation area shown in Figure B1 begins almost one river mile downstream from the mouth of Bryant Creek. Please include the EFCR reach immediately downstream from the mouth of Bryant Creek in the downstream study area. **ARC Response May 18, 2017:** ARC revised the text and figures to show that the downstream reach to be investigated extends downstream from the mouth of Bryant Creek. **EPA Comment:** The ARC response is adequate.

- **EPA April 18, 2016 Comment on Appendix B: Section 2.3.2 Results. Terrace deposits at Ruhenstroth Dam site.** Please include a more thorough description of the upper and lower terraces. For ex ample, please evaluate additional photos to support the interpretation that upper and lower terrace deposits are present. The provided goo gle earth image supports the presence of two terraces. An alternative interpretation is that the feature identified as the lower terrace represents material that has accumulated at the foot of the terrace due to erosion from the terrace and deposition at the foot of the terrace. ARC should conduct sufficient characterization to ensure that the material sampled represents in-situ EFCR sediment terrace deposits, and not accumulation of sediment eroded from the terrace. **ARC Response:** ARC provided additional information and explained that the origin of the features identified as terraces would be determined during field reconnaissance and that the identified area would be sampled only if the terrace was of alluvial origin. **EPA Comment:** The ARC response is adequate.

- **EPA April 18, 2016 Comment on Appendix B: Section 2.3.2 Results. Terrace deposits at Ruhenstroth Dam site:** A preliminary review indicates that the transects cross a channel like form that was present in google earth imagery for 1993 and 1998. It is not clear how a terrace from the 1950s and a 1990s channel could coincide. Please provide additional evaluation and ensure that the selected transects will intercept a 1950's and later terrace deposit. **ARC Response:** ARC's response provided additional discussion of the features in question. **EPA Comment:** The ARC response is adequate.

- **EPA April 18, 2016 Comment on Appendix B: Section 2.3.2 Results. Channel Migration and Transects.** It is difficult to evaluate the relationship between samples of channel fill, and samples along transects because the two types of samples are shown on separate figures. Please show the two types of samples on the same figure and verify that the channel fill and transect samples are located in close proximity to one another. **ARC Response:** ARC clarified that transect and channel fill samples are intended to be the same and that actual sample locations will be selected along transects during field reconnaissance. **EPA Comment:** The ARC response is adequate.

- **EPA April 18, 2016 Comment on Appendix B: Section 3.0 Summary and Recommendations.** The bullets all appear to reference the wrong figure numbers. Please provide a complete review and ensure the references to figures are accurate and complete. **ARC Response:** ARC revised the text and figures to be consistent. **EPA Comment:** The ARC response is adequate.

- **EPA April 18, 2016 Comment on Appendix B: Table B1:** The table shows that only two images (from 2010 and 2014) were used to evaluate the upstream reach. EPA directs Atlantic Richfield to analyze and evaluate additional information sources. For ex ample, google earth imagery dating back to 1993 is available for the upstream reach of EFCR. **ARC Response:** ARC stated that images from 1954 through 2014 were used to evaluate the upstream reach. **EPA Comment:** The ARC response is adequate.

HISTORY ON TSAP

EPA April 18, 2016 Previous Comment on the TSAP: G1: Sa mple Locations. Sample locations in Figure 1 do not appear to be located along EFCR in close proximity to the mouth of Bryant Creek. The figure shows that the downstream reach begins about one river mile downstream from the mouth of Bryant Creek. Comparison with Figures 2 and 3 shows that sediment samples are not to be collected within about 3 to 4 river miles downstream from the mouth of Bryant Creek. Please include sampling transects within the first mile downstream from the mouth of Bryant Creek in the sampling program.

Similarly, sample locations selected for EFCR upstream from Cottonwood Creek are about five to six river miles upstream from the mouth of Cottonwood Creek. Transect TR-42 appears to be upstream from the upstream end of the upstream reach. Please include an additional set of sample transects to the reach of EFCR about 1 to 3 miles upstream from the mouth of Cottonwood Creek. **ARC Response:** ARC added additional transect sampling locations as shown on Figure 8 of the Draft Final TSAP. **EPA Comment:** The ARC response is adequate.

- **EPA April 18, 2016 Comment on the TSAP: G2: Data Quality Objectives.** The Data Quality Objectives (DQO) do not mention human health risk assessment. Recreational use (white water rafting, swimming, and fishing) are all known to occur within the potentially affected EFCR reach. In addition, Washoe foraging is not prohibited along EFCR. Therefore, human exposure scenarios must be considered in development of the DQOs and sampling plan. **ARC Response:** ARC revised the DQO text to address screening-level human health and ecological risk evaluations. **EPA Comment:** The ARC response is adequate

- **EPA April 18, 2016 Comment on the TSAP: S1: Page 4 Last Paragraph of Section 3.0:** The text mentions a focus of sampling activities on fine textured materials. However, fine textured materials are not defined. Please define what is meant by fine textured materials. And ensure that this definition and reference to fine texture material is consistent throughout

the document. **ARC Response:** ARC revised the text to define medium textured materials as sand (< 2 mm), and fine textured material as silt and clay (< 63 μm). **EPA Comment:** The ARC response is adequate.

- **EPA April 18, 2016 Comment on the TSAP: S2: Page 5, Last Paragraph of Section 4.0:** This paragraph is structured similar to a decision statement, however, the statements here are not included in the Appendix A DQOs. For consistency and to ensure that the DQOs will be met by data collected under the TSAP, the three problem statements from Appendix A and associated study objectives should be summarized here. **ARC Response:** ARC revised the DQOs. **EPA Comment:** The ARC response is adequate.

- **EPA April 18, 2016 Comment on the TSAP: S5. Page 6 Section 5.1, Third Paragraph.** The first sentence states that the Downstream Reach extends from Bryant Creek downstream to the former Ruhenstroth Dam. This description is not consistent with Figure 1 which shows a gap of about a river mile between the mouth of Bryant Creek and the upstream end of the Downstream Reach. Please modify Figure 1 to show the Downstream Reach beginning at the mouth of Bryant Creek and extending to the Ruhenstroth Dam Site; and please add additional sample transects to sample EFCR sediment immediately downstream from the mouth of Bryant Creek. **ARC Response:** ARC revised Figure 1 to show that the downstream reach to be investigated extends downstream from the mouth of Bryant Creek. **EPA Comment:** The response is adequate.

- **EPA April 18, 2016 Comment on the TSAP: S6. Page 11, Section 5.4, Fifth Bullet.** The bullet states that one sample will be collected at each transect for grain size analysis. Table 2 shows that grain size analysis will be performed on sediment from the 0 to 0.5-foot depth. Criteria for selecting a sample for grain size analysis are not provided. Criteria for use by field staff to select a sample for grain size analysis need to be provided. For example, such criteria would address what the field sampling team members should do if the 0 to 0.5-foot depth consisted of cobbles. **ARC Response:** ARC revised the text to specify that a medium to fine textured (<2mm) sample was the target for sampling and for grain size analysis. **EPA Comment:** The response is adequate.

- **EPA April 18, 2016 Comment on the TSAP: S7. Page 18, Sample Collection, Second Paragraph**. The last sentence states that twelve samples meet the minimum number of samples for statistical analysis recommended in ProUCL software. The actual minimum number of samples depends on the material being sampled (the material from one depth could comprise chemical sediment, clay, and sand from different locations, in this case there would be less than 12 samples of the same material from each depth), variance of the measurement of interest in the sample, and the acceptance criteria for usefulness of the data. Please include acceptance criteria for data usefulness. **ARC Response:** ARC revised the sampling program to include collection of up to 45 samples from each of the upstream and downstream reaches. Regarding the acceptance criteria, ARC referred to comments S13

and S14. **EPA Comment:** The response is adequate.

- **EPA April 18, 2016 Comment on the TSAP: S8. Page 18, Sample Collection, Third Paragraph**. The first sentence states that samples for radiometric dating will be collected in separate cores from those of other samples. Please update the text to clarify that the location of the cores for radiometric dating will be one of the chemical sampling transects in each of the study areas. **ARC Response:** ARC revised the text to specify that samples for radioactive dating would be collected along a transect adjacent to another sample location. **EPA Comment:** The ARC response is adequate.

- **EPA April 18, 2016 Previous Comment on the TSAP S10. Page 19, Quality Control Sample Collection, Second Paragraph.** The text states that measurement quality control criteria for soil samples are included Table 2. Table 2 does not include measurement quality control criteria. Please include the measurement quality control criteria for sediment samples. **ARC Response:** ARC revised the text by removing reference to Table 2, and states that the measurement criteria are in the RI/FS QAPP. **EPA Comment:** The response is adequate.

- **EPA April 18, 2016 Previous Comment on the TSAP S11. Page 22, National Historic Preservation Act.** The text states that if a programmatic agreement is not obtained before May 30, 2016, then NHPA consultation may not be completed in time to complete field sampling during the 2016 field season. Please consider and consult with EPA on whether sample locations within the EFCR active channel deposits may not be subject to NHPA requirements. **ARC Response:** ARC revised the text to refer to the protocols for Section 106 compliance provided by EPA on April 19, 2016. **EPA Comment:** The response is adequate.

- **EPA April 18, 2016 Previous Comment on the TSAP S12. Appendix A DQO Summary Step 4 Define Boundaries.** The TSAP text notes that sampling will occur during periods of low flow and avoid periods of high river stage. St ep 4 discussion of boundary limitations do not identify flow limitations. Please include mention of river stage limitation. **ARC Response:** ARC revised the DQO text to note that sampling will occur only when streamflow is low enough for safe access. **EPA Comment:** The response is adequate.

- **EPA April 18, 2016 Previous Comment on the TSAP S13. Appendix A DQO Summary Problem Statement No. 2, Step 6 Specify Acceptance Criteria.** The use of professional judgement supported by statistical methods is mentioned as part of evaluating multiple lines of evidence. Please include acceptance criteria for assessing professional judgement (for example, what confidence is acceptable as a basis for assessing the significance of statistical comparisons). Please include acceptance criteria for assessing the suitability for use of data for the identified purposes (spatial trends, exposure concentrations, etc.). **ARC Response:** ARC revised the DQO text to include acceptance criteria. **EPA Comment:** The response is adequate.

- **EPA April 18, 2016 Previous Comment on the TSAP S14. Appendix A DQO Summary Problem Statement No. 3, Step 6 Specify Acceptance Criteria.** The text states that comparisons will be designed once sufficient useable data sets from both reaches are obtained. Please provide the acceptance criteria for determining data sufficiency. **ARC Response:** ARC revised the text to include acceptance criteria. **EPA Comment:** The response is adequate.